

The 400 Meters: Stereo Topographic Mapping of the Bright Terrain-Dark Terrain Boundary on Ganymede

P. Schenk (LPI, Houston), K. Jones (Brown U.), B. Fessler (LPI, Houston)

The resurfacing of Ganymede in the form of bright terrain remains a central issue in understanding why this body is so different from neighboring Callisto. Few useful constraints on the elevation of bright terrain relative to dark terrain exist. In 1994, LPI began development of stereogrammetric auto-correlation software designed to produce topographic maps of the icy satellites using Voyager images. Reliable DEMs are now possible on Ganymede. Fault-bounded lanes of bright terrain near the south pole show clearly in our DEMs as linear troughs ~400 m deep. Together with earlier studies of the thickness of bright terrain, these new data suggest that structural troughs in which bright terrain form are 1.5 to 2 km deep, and confirm that many of these troughs are only partially filled by bright terrain material. If driven solely by buoyancy, the maximum height (relative to dark terrain) to which bright material can be extruded is a function of the product of the magma-crust density difference and the depth of the magma chamber. For a density difference of 50 kg/m³, the depth to magma chambers beneath bright terrain is 8 km.

Division for Planetary Sciences Abstract Form

DPS Category 14

Running #7449

Session 0.00

Invited ☐ Poster presentation ☒ Title only ☐

Have you received your Ph.D. since the last DPS meeting?

Yes ☐ No ☐

Is your abstract newsworthy, and if so, would you be willing to prepare a news release and be available for interviews with reporters?

Yes ☐ No ☐ Maybe ☒

Paper presented by Paul Schenk
3600 Bay Area Blvd

Houston TX 77058 usa
Phone: 486-8312
Fax: 486-2162
Email: schenk@lpi.jsc.nasa.gov

Special instructions: Tue Aug 27 16:24:22 CDT 1996

Membership Status (First Author):

DPS-AAS Member ☒ Non-Member ☐

Student Member ☐ Student Non-Member ☐

Is this your first DPS presentation? Yes ☐ No ☐

Sponsor:

Abstract submitted for 1996 DPS meeting

Date submitted: LPI electronic form version 5/96